What is claimed is:

1. A magnetic displacement measurement device, comprising a ruler body and a vernier which can move with respect to the ruler body, wherein a magnetic main ruler is fixed on the ruler body, and a secondary ruler is fixed on the vernier; the secondary ruler comprises a magnetic sensor and a measurement circuit thereon; said measurement circuit outputs the signal of movement distance to an signal output device; being characterized in that:

said magnetic main ruler is of grid type, wherein grids are arranged at a constant interval along a movement direction with a grid pitch of λ;

said magnetic sensor is composed of magnetoresistances which are opposite to the magnetic main ruler and arranged along the movement direction; and

said measurement circuit comprises at least two measurement bridges composed of magnetoresistances.

2. The magnetic displacement measurement device according to claim 1, being characterized in that: said magnetic main ruler is provided such that magnetic grids arranged with a grid pitch of λ are provided on a nonmagnetic material substrate.

3. The magnetic displacement measurement device according to claim 1, being characterized in that: the magnetoresistances of said magnetic sensor are formed of at least one layer of magnetic film and nonmagnetic film which are alternately arranged.

4. The magnetic displacement measurement device according to claim 3, being characterized in that: the magnetic film of said magnetoresistances is selected from one of metal film, alloy film or semiconductor film.

5. The magnetic displacement measurement device according to claim 1, being characterized in that: said at least two measurement bridges are electrically connected with an AC power supply, and the phase difference of

the AC power supply connected with said at least two measurement bridges is $\pi/2$.

6. The magnetic displacement measurement device according to claim 1, being characterized in that: said magnetic main ruler is provided such that magnetic grids arranged with a grid pitch of λ are provided on a nonmagnetic material substrate; the magnetoresistances of said magnetic sensor are formed of at least one layer of magnetic film and nonmagnetic film which are alternately arranged; said at least two measurement bridges are electrically connected with an AC power supply, and the phase difference of the AC power supply connected with two measurement bridges is $\pi/2$.

7. The magnetic displacement measurement device according to claim 1 or 6, being characterized in that: the position difference between the magnetoresistances of the same arms of said two measurements bridges is $n\lambda/4$, wherein n= 1,3,5,7 ...

8. The magnetic displacement measurement device according to claim 1, 5 or 7, being characterized in that: the measurement bridge with a position lead of $n\lambda/4$ is provided with an AC signal with a phase lag of $\pi/2$, wherein n= 1,3,5,7 ...; the measurement bridge with a position lag of $n\lambda/4$ is provided with an AC signal with a phase lead of $\pi/2$, wherein n= 1,3,5,7 ...

9. The magnetic displacement measurement device according to claim 1 or 6, being characterized in that: said measurement bridges are composed of at least two magnetoresistances, wherein at least two adjacent resistors of the bridges are magnetoresistances with a position difference of $n\lambda/2$, n=1,3,5,7...

10. The magnetic displacement measurement device according to claim 9, being characterized in that: the position difference between two magnetoresistances which face with each other in said measurement bridges

is mλ, wherein m=0,1,2,3,...

11. The magnetic displacement measurement device according to claim 1 or 6, being characterized in that: the magnetoresistances on each arm of said measurement bridges are composed of constant number of magnetoresistances in series with different positions , and a position difference thereof is mλ, wherein m= 0,1,2,3,...

12. The magnetic displacement measurement device according to claim 1 or 6, being characterized in that: the width of said magnetoresistances is smaller than λ/2; each of magnetoresistances is formed of magnetoresistances with same number and same width in series, with a total width smaller than λ/2.

13. The magnetic displacement measurement device according to claim 1 or 6, being characterized in that: said two measurement bridges output signals in a function relation with the displacement, the signals are summed and then converted into digital signals through A/D conversion, and the digital signals are coupled with the signal output device.

14. The magnetic displacement measurement device according to claim 2 or 6, being characterized in that: said magnetic main ruler is provided such that magnetic grids with the grid pitch of λ are formed on the nonmagnetic material substrate by plating and etching process, or are embedded in the nonmagnetic material substrate.

15. The magnetic displacement measurement device according to claim 2 or 6, being characterized in that: said magnetic main ruler is provided such that convexes and concaves in grid type with the grid pitch of λ are formed on the surface of the magnetic material.